

CLAIMS

1. A single-crystal transparent ferromagnetic compound selected from the group consisting of alkaline earth chalcogenides, alkali chalcogenides, I-VII compounds, II-VI compounds, III-V compounds, IV-VI₂ compounds, IV-IV compounds, and II-VII₂ compounds, wherein at least one element having an incomplete outermost p-electron shell is dissolved so that the compound has a ferromagnetic transition temperature of room temperature or higher.

2. The single-crystal transparent ferromagnetic compound according to Claim 1, comprising an alkaline earth chalcogenide selected from the group consisting of MgO, CaO, SrO, and BaO or an alkali chalcogenide comprising K₂S, wherein the element having an incomplete outermost p-electron shell is C, N, Si, or Ge.

3. The transparent ferromagnetic compound according to Claim 1, being doped with at least one of an n-type dopant and a p-type dopant.

4. A method for producing the single-crystal transparent ferromagnetic compound according to Claim 1, comprising depositing the compound selected from the group consisting of alkaline earth chalcogenides, alkali chalcogenides, I-VII compounds, II-VI compounds, III-V compounds, IV-VI₂ compounds, IV-IV compounds, and II-VII₂ compounds while

adding the element having an incomplete outermost p-electron shell.

5. A method for controlling the ferromagnetic properties of the single-crystal transparent ferromagnetic compound in the method according to Claim 4, comprising adjusting the concentration of the dissolved element to control the ferromagnetic properties.

6. A method for controlling the ferromagnetic properties of the transparent ferromagnetic compound in the method according to Claim 4, comprising additionally doping the compound with at least one of an n-type dopant and a p-type dopant in the deposition.

7. The method for controlling the ferromagnetic properties of the transparent ferromagnetic compound according to Claim 5 or 6, wherein ferromagnetic transition temperature is controlled among the ferromagnetic properties.

8. The method for controlling the ferromagnetic properties of the transparent ferromagnetic compound according to Claim 5 or 6, wherein the ferromagnetic properties are controlled by adjusting the energy of a ferromagnetic state and adjusting the number of carriers with holes or electrons introduced by the dissolved element so that the total energy of the ferromagnetic state is decreased relative to that of a spin-glass state to stabilize a desired ferromagnetic state relative to the

spin-glass state, thereby developing the ferromagnetic state.

9. The method for controlling the ferromagnetic properties of the transparent ferromagnetic compound according to Claim 5 or 6, wherein the ferromagnetic properties are stabilized by controlling the magnitude and sign of interatomic magnetic interaction with holes or electrons introduced by the dissolved element.

10. The method for controlling the ferromagnetic properties of the transparent ferromagnetic compound according to Claim 5 or 6, wherein a ferromagnetic compound having desired optical filtering properties are achieved by controlling the magnitude and sign of interatomic magnetic interaction with holes or electrons introduced by the dissolved element having an incomplete outermost p-electron shell and adjusting the magnitude of a band gap with the dissolved element to control optical transmission properties.